

Claims

1. An electrical circuit element comprising an elongate electrical conductor (1) coupled magnetically with at least one thin layer of magnetic material (5; 6, 7, 11, 12) extending along at least a part of said conductor juxtaposed with the conductor,

characterised in that the aspect ratio of the thickness of said layer of magnetic material (5; 6, 7, 11, 12) to its lateral dimensions is between 0.01 and 0.5.
2. An electrical circuit element as claimed in claim 1, wherein said aspect ratio is less than 0.1.
3. An electrical circuit element as claimed in claim 1 or 2, wherein said part of said conductor (1) is disposed within said layer of magnetic material (5; 6, 7, 11, 12).
4. An electrical circuit element as claimed in any preceding claim, wherein said elongate electrical conductor (1) is coupled magnetically with a plurality of said thin layers of magnetic material (6, 7, 11, 12) extending along at least a part of said conductor above and below the conductor, the aspect ratio of the thickness of each of said layers (6, 7, 11, 12) of magnetic material to its lateral dimensions being between 0.01 and 0.5.
5. An electrical circuit element as claimed in claim 4, wherein said aspect ratio is less than 0.1.
6. An electrical circuit element as claimed in any of claims 4 to 5, and including magnetic interconnections (13, 14) extending beside said conductor (1) and interconnecting said layers of magnetic material (6, 7, 11, 12) at positions where magnetic flux generated by electrical current flowing along said conductor is transverse to said layers.
7. An electrical circuit element as claimed in claim 6 wherein the lateral dimensions of said interconnections (13, 14) are small compared to the lateral dimensions of said layers (6, 7, 11, 12).

8. An electrical circuit element as claimed in any of claims 4 to 7, and including a plurality of said layers of magnetic material (6, 11) extending above said conductor (1) and a plurality of said layers of magnetic material (7, 12) extending below said conductor.
9. An electrical circuit element as claimed in any of claims 4 to 8, wherein said conductor (1) extends in a spiral between said layers of magnetic material (6, 7, 11, 12).
10. An electrical circuit element as claimed in any of claims 4 to 8, wherein said conductor (1) extends in a meander between said layers of magnetic material (6, 7, 11, 12).
11. An electrical circuit element as claimed in any preceding claim, wherein said magnetic material comprises a ferromagnetic material.
12. An electrical circuit element as claimed in any preceding claim, wherein said magnetic material is a composite material that comprises particles of a magnetic material densely packed in a substantially non-magnetic, electrically resistive matrix.
13. An electrical circuit element as claimed in any preceding claim, wherein said magnetic material is a sputtered film of highly resistive ferromagnetic material.
14. Electrical circuit apparatus comprising an electrical circuit element as claimed in any preceding claim and inductance responsive means responsive to the inductance said electrical circuit element presents to a periodic current flowing in said conductor (1).
15. Electrical circuit apparatus as claimed in claim 14, wherein said electrical circuit element and said inductance responsive means are disposed on a common support layer.
16. Electrical circuit apparatus as claimed in claim 15, wherein said electrical circuit element and said inductance responsive means are parts of a common integrated circuit.